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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/479,211	06/07/95	OHTANI H	0756-1365

D1M1/0306
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EXAMINER	
RADOMSKY,L	
ART UNIT	PAPER NUMBER
1104	

DATE MAILED: 03/06/96

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

A shortened statutory period for response to this action is set to expire three months(s), or thirty days, whichever is longer, from the date of this communication.

Office Action Summary	Application No. 08/479,211	Applicant(s) Ohtani et al.
	Examiner Leon Radomsky	Group Art Unit 1104

☐ Responsive to communication(s) filed on _____ .

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1 _____ is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1 _____ is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☒ received in Application No. (Series Code/Serial Number) 08/391,580 .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5,7

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Part III DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

3. Claim 1 is rejected under 35 U.S.C. § 103 as being unpatentable over Zhang et al. (US '772) or Hultman et al. (J. Appl. Phys.) in view of Yonehara (US '093) or Shibata (US '224). Zhang teaches forming an amorphous silicon (a-Si) film on a glass

substrate, forming a cover film on said a-Si, forming a continuous catalyst film on at least a portion of said a-Si layer, optionally removing said first cover film and forming a second cover film in contact with the a-Si and either thermally or laser recrystallizing said a-Si (Fig. 7, Fourth Embodiment). Said cover films comprise silicon nitride (Col. 7, Lines 23-24 and Col. 16, Lines 30-40).

Hultman teaches forming an a-Si layer in contact with a silicon nitride substrate and with a continuous catalyst layer (Au), followed by thermally recrystallizing said a-Si at a low temperature (Fig. 1 and Sections II,V). Zhang and Hultman do not teach a thermal crystallization followed by a light irradiation.

Yonehara teaches that if a thermal recrystallization anneal is followed by a lamp irradiation, grain size is increased and intergrain defects are removed (Col. 2, Lines 10-30). A silicon nitride capping layer is used to decrease surface roughness that might occur during the irradiation (Col. 4, Lines 41-55).

Shibata teaches that polysilicon resistance is reduced if a laser anneal is applied after a thermal treatment (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to irradiate the recrystallized Si layers of Zhang or Hultman after the thermal treatment in order to increase the Si grain size and eliminate defects, as taught by Yonehara, and to reduce Si resistance, as taught by Shibata. Alternatively,

it would have been obvious to one of ordinary skill in the art to add a catalyst of Zhang or Hultman to the crystallization process of Yonehara in order to reduce the crystallization temperature and to obtain a preferred grain growth direction.

Double Patenting

4.The non-statutory double patenting rejection, whether of the obvious-type or non-obvious-type, is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent. *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Van Ornam,* 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); and *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321 (b) and (c) may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.78 (d).

Effective January 1, 1994, a registered attorney or agent of record may sign a Terminal Disclaimer. A Terminal Disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,5 of copending application Serial No. 08/391,580. Although the conflicting claims are not identical, they are not patentably distinct from each other because a catalyst layer applied from a solution is continuous.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Shimizu (JP '216) and Zhang et al. (US '291) teach a thermal anneal to outgas hydrogen from non single crystalline Si followed by a laser anneal to improve the crystallinity of said Si.

b. Yamaguchi (JP '722) teaches laser annealing a-Si in contact with 2 SiN layers.

6. In order to ensure full consideration of any amendments, affidavits or declarations, or other documents as evidence of patentability, such documents **must** be submitted in response to this Office action. Submissions after the next Office action, which is intended to be a final action, will be governed by the requirements of 37 C.F.R. § 1.116, which will be strictly enforced.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Leon Radomsky** whose telephone number is (703) 305-3445.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661. Group 1100 fax number is (703) 305-3600.

T. Thomas

TOM THOMAS
PRIMARY EXAMINER
GROUP 1100

LR

2/22/96